

Studies on Fresh-water Diatoms of Western Japan (II)*

by

Yasumi IWAHASHI

岩橋八洲民：西部日本ノ淡水産硅藻（其二）

IV. *Meridion* AGARDH

Frustules in circular or spiral fasciæ, at length becoming free. Valves clavate, with transversal costæ and striæ.

There are only one species and one variety in our country, as following;

1. *Meridion circulare* (GREV.) AGARDH : WOLLE, Atlas Diat. North Amer. Pl. xxxvii, fig. 24, 25, 27, 28, 1894; BOYER, Syn. North Amer. Diat. I, p. 172, 1927; HUSTEDT, Kiesalg. (RABENHORST's Kryptogam. Bd. VII) 2 Teil, lief. 1, p. 93, fig. 627 a-f. 1931.

Valves clavate or ovoid, with broad rounded apex and narrow rostrate base. Costæ coarse, 3-4 in 10 μ , at variable distances apart, sometimes indistinct. Striæ 16-18 in 10 μ . 17-22 μ long, 5-6 μ wide in the middle.

Hab. In stagnant water, pools, streams, and the lakes.

Honshû : Okayama, prov. Bizen (Y. IWAHASHI, Oct. 1935); Fukuyama prov. Bingo (Y. IWAHASHI, Nov. 1936); Hiroshima, prov. Aki (IWAHASHI, June 1935); Chôfu, prov. Nagato (Y. IWAHASHI, Aug. 1935).

Kyûshû : Moji, prov. Buzen (Y. IWAHASHI, Aug. 1935); Fukuoka, prov. Chikuzen (Y. IWAHASHI, Aug. 1935); Koshikishima (Y. IWAHASHI, Aug. 1934); Kagoshima, prov. Satsuma (Y. IWAHASHI, Aug. 1935).

Dist. Arctic region (Cape Sabine); Europe; North America; New Zealand; Africa; Siberia; Mongolia; Manchoukuo; Eastern Japan (Aoki-ko).

var. *constricta* (RALFS) V. HEURCK in Syn. Diat. Belg. Taf. 51, figs. 13-15, 1880-1881; Journ. Japan. Bot. Vol. XII. No. 10, p. 741, fig. 3, 1936.

Syn. *Meridino constrictum* RALFS.

* 本研究ノ材料蒐集ニ就テノ費用ハ日本學術振興會ノ援助ニ負フ所ガ多イ。ココニ厚ク感謝ノ意ヲ表スル次第デアル。

Valves clavate. Apex constricted in the shape of the head. Length 5-27 μ , breadth 5-7 μ .

Hab. In the lake and stagnant water.

Honshû: Kibagata, prov. Kaga (Y. IWAHASHI, Oct. 1935); Yoganoumi, prov. Ômi (Y. IWAHASHI, Oct. 1935); Shôbara, prov. Bingo (Y. IWAHASHI, April 1936).

Shikoku: Kotohira, prov. Sanuki (Y. IWAHASHI, Dec. 1936); Imabari, prov. Iyo (Y. IWAHASHI, Dec. 1936).

Kyûshû: Beppu, prov. Bungo (Y. IWAHASHI, Jan. 1935).

Dist. Europe; North America; South America; New Zealand; Africa; Manchoukuo; Eastern Japan (Murayama, prov. Musashi; Shichimenzan, prov. Kai)

V. *Diatoma* DE CANDOLLE

Hitherto, two species and one variety belonging to *Diatoma*. i.e. *D. elongatum* AG., *D. hiemale* HEIB., and var. *mesodon* (EHR.) GRUN., have been reported by Dr. H. HATTORI, Dr. H. NAKANO, K. TSUMURA, S. MORI, and FR. HUSTEDT in Japan. And they were found from Western Japan, too.

Frustules united in ribbon-form or secondarily solitary. Valves with transverse striæ and costæ.

1. *Diatoma elongatum* (LYNGBYE) AGARDH: Japan. Journ. Limnol. Vol. 6, No. 4, p. 160, 1936.

Hab. As a component of potamoplankton of the Yoshino River, Shikoku (after S. MORI).

Dist. Europe; North America; South America; Himalayas; Eastern Japan (Aoki-ko).

2. *Diatoma hiemale* (LYNGBYE) HEIBERG: HUSTEDT, Kiesalg. RABENHORST's Kryptogam. Bd. VII) 2 Teil, Lief. 1, fig. d, 1931.

Frustules united in short band. Valves oblong, round at the ends. Length

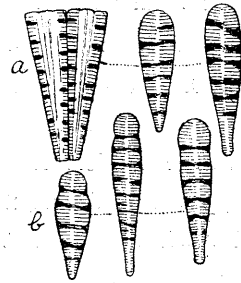


Fig. 4. a. *Meridion circulare* ($\times 800$). b. var. *constricta* ($\times 800$)

25–43 μ , breadth 8–9 μ . Costæ 7–10. Transversal striæ subtile.

Hab. In springs.

Yakushima : Ambô-Kosugidani, Hananogô, (Y. IWAHASHI, July 1933).

Dist. Europe ; North America ; South America ; Eastern Japan (Yokohama, after H. HATTORI).

var. **mesodon** (EHRENBERG) GRUNOW : HUSTEDT, Kiesalg. (RABENHORST'S Kryptogam. Bd. VII) 2 Teil, Lief. 1, p. 102, fig. 631, d, 1930 ; MEISTER, Kiesalg. Schw. p. 63, Taf. V, figs. 19, 20, 1912 ; Journ. Coll. Sci. Imp. Univ. Tokyo, Vol. XL, Art. 4, Taf. III, fig. 2, 1917 ; Journ. Japan. Bot. Vol. XII, No. 10, p. 735, fig. 2, 1936.

Frustules in long chains. Valves elliptic or ovate-lanceolate. Length 13–18 μ , breadth 6–8 μ in the middle. Transversal striæ subtile. Costæ 2–5.

Hab. In the mountain-streams, streams, and springs.

Honshû : Kanazawa, prov. Kaga (Y. IWAHASHI, Oct. 1935) ; Hiroshima, prov. Aki (Y. IWAHASHI, April 1934) ; Yanai, prov. Suô (Y. IWAHASHI, April 1934) ; Shimonoseki, prov. Nagato (Y. IWAHASHI, Aug. 1936).

Shikoku : Ôzu prov. Iyo (Y. IWAHASHI, Dec. 1936) ; Uwazima, prov. Iyo (Y. IWAHASHI, Dec. 1936).

Kyûshû : Beppu, prov. Bungo (Y. IWAHASHI, Jan. 1934) ; Koshikishima (Y. IWAHASHI, Aug. 1934).

Dist. Europe ; North America ; South America ; Lhe ; Pangon-Tso ; Eastern Japan (Aoki-ko ; Shichimenzan).

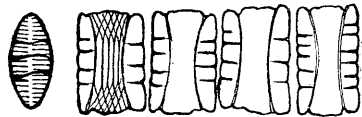


Fig. 5. *Diatoma hiemale* var. *mesodon* ($\times 800$)

VI. *Tabellaria* EHRENBERG

There are two species and one variety in Western Japan. They are common in the fresh-water.

Frustules quadrangular, in stellate colonies or zigzag chains, at length separating. Septa straight or slightly curved, extending nearly to the centre. Valves linear, inflated in the middle and ends. Pseudoraphe narrow. Striæ transversal.

1. **Tabellaria fenestrata** (LYNGBYE) KÜTZING: MEISTER, Kiesalg. Schw. p. 55, 1912; BOYER, Syn. North Amer. Diat. p. 151, 1926; HUSTEDT, Kiesalg. (RABENHORST's Kryptogam. Bd. VII) 2 Teil, Liet. 1, p. 26, fig. 554, 1931.

Frustules with two septa at each ends, in zigzag chains. Valves linear, elongated, inflated in the middle and at the ends. Pseudoraphe linear and narrow. Length of valves 57–95 μ , breadth 6–8 μ in the middle, 5–6 μ at the ends. Transversal striae 17–19 in 10 μ .

Hab. In streams, ponds and ditch.

Honshû: Nara (Sagi-ike), prov. Yamato (Y. IWAHASHI, Dec. 1935); Kôbe, prov. Settsu (Y. IWAHASHI, July 1935); Iwakuni, prov. Suo (Y. IWAHASHI, April 1934).

Shikoku: Kôchi, prov. Tosa (M. MICHIIHIRO, Mar. 1937); Ikeda, prov. Awa (Y. IWAHASHI, Dec. 1936).

Kyûshû: Fukuoka, prov. Chikuzen (Y. IWAHASHI, Aug. 1935); Kurume, prov. Chikugo (Y. IWAHASHI, Aug. 1935).

Dist. Europe; North America; Siberia; Mongolia; Manchoukuo; chosen; Eastern Japan (Aoki-ko; Nojiri-ko; Suwa-ko; Kasumigaura; Tega-numa; Murayama; Ashino-ko).

var. **lacustris** MEISTER in Kiesalg. Schw. p. 55 and 232, Taf. IV, figs. 6, 7, 1912.

Frustules in zigzag chains or stellate colonies. Septa 1–3 at each ends. Length of valves 55–66 μ , breadth 6–8 μ in the middle, about 5 μ at the ends. Striae 19–21 in 10 μ .

Hab. In streams and pond.

Honshû: Yamanaka, prov. Kaga (Y. IWAHASHI, Oct. 1935); Hiroshima, prov. Aki (Y. IWAHASHI, April 1933 and June 1935); Chôfu, prov. Nagato (Y. IWAHASHI, Aug. 1934).

Dist. Europe.

This variety is new to the flora of Japan.

2. **Tabellaria flocculosa** (ROLF) KÜTZING: HUSTEDT, Kiesalg. (RABENHORST's Kryptogam. Bd. VII) 2 Teil, Lief. 1, p. 28, fig. 558, 1931.

Syn. *Tabellaria flocculosa* var. *ventricosa* in MEISTER, Kiesalg. Schw. p.

57, Taf. IV, fig. 12, 1921.

Frustules quadrangular, in zigzag chains. Septa 4-6 in my collecting material, somewhat incurved. Length of valves $20-35\mu$, breadth about 10μ in the middle, $3-5\mu$ at ends. Striae about 18 in 10μ .

Hab. In streams and springs.

Honshû: Kanazawa, prov. Kaga (Y. IWAHASHI, Oct. 1935); Kôriyama, prov. Yamato (Y. IWAHASHI, Dec. 1934); Kôbe, prov. Settsu (after H. HATTORI); Miyajima, prov. Aki (Y. IWAHASHI, April, 1932 and 1935); Chôfu, prov. Nagato (Y. IWAHASHI, Aug. 1934).

Dist. Europe; North America; Hymalayas; Manchuokuo; Chôsen; Eastern Japan (Aoki-ko; Suwa-ko; Tôkyô; Kawaguchi-ko; Kasumigaura; murayama; Ashino-ko).

VII. *Actinella* LEWIS

Actinella brasiliensis GRUN. has been found in Chôsen by B.W. SKVORTZOW (1929), and recently I found it, too, at several places in Western Japan.

Valves slightly bowed, with heteropole, namely narrow wedge-shaped outline. Striae punctate, transversal. Frustules in fan-shaped colonies.

1. *Actinella brasiliensis* GRUNOW: Journ. Chosen Natur. Hist. Soc. No. 8, p. 10, Pl. I, fig. 2, 1929; Van HEURCK, Syn. Diat. Belg., Pl. 35, fig. 19, 1880-1881.

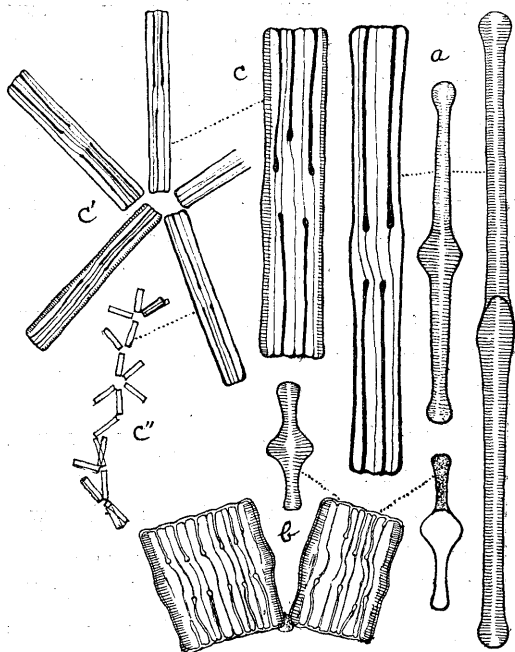


Fig. 6. a. *Tabellaria fenestrata* ($\times 800$) c. var. *lacustris* ($\times 800$) c' ($\times 400$) c'' ($\times 100$) b. *T. flocculosa* ($\times 800$)

Length of valves 60–87 μ . breadth 5–6 μ in the middle part. Striæ 16 in 10 μ .

Hab. On the water-plants or rotty wood in the lake, pond and ditch.

Honshû: Kibagata, Prov. Kaga (Y. IWAHASHI, Oct. 1935); Hiroshima and Akinakano, prov. Aki (Y. IWAHASHI, April 1934).

Kyûshû: Moji, prov. Buzen (Y. IWAHASHI, Dec. 1935).

Dist. Europe; Chôsen.

This species is a new addition to the flora of Japan Proper.

VIII. *Peronia* BREB. et ARN.

FR. HUSTEDT had already reported *Peronia erinacea* BREB. et ARN. in his paper (1923), while I found *P. Heribaudi* BRUN. et PERAG. in the fresh water of some places in Western Japan.

Cells wedge-shaped in girdle and valve view. Raphe short and standing near poles. All axis of frustule straight. Striæ transversal, and absent at the ends.

1. *Peronia Heribaudi* BRUN. et PERAGALLO: HUSTEDT, Kieselg. (RABENHORST's Kryptogam. Bd. VII) 2 Teil, Lief. 2, p. 262, fig. 739, 1932.

Valves wedge-shaped, with suddenly narrowed broadly round apex and gradually becoming cramped base. Raphe short, thread-like. Striæ transversal, parallel, 16–17 in 10 μ . Length 22–25 μ , breadth in the middle 3–4 μ .

Hab. On the bed of stagnant water.

Honshû: Hatsukaichi, near Hiroshima, prov. Aki (Y. IWAHASHI, April 1934).

Kyûshû: Kagoshima, prov. Satsuma (Y. IWAHASHI, Aug. 1934).

Yakushima: Ambô-Kosugidani (Y. IWAHASHI, July 1933).

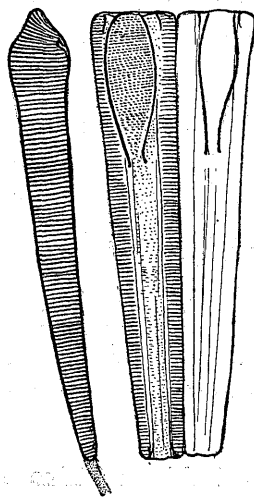


Fig. 7. *Actinella brasiliensis* ($\times 800$)

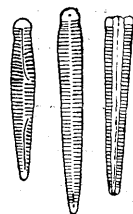


Fig. 8. *Peronia Heribaudi* ($\times 800$)

Dist. Europe.

This species is new to the flora of Japan.

IX. *Neidium* PFITZER.

There are six kinds which have been seen by the author in Western Japan. And three species among them (*N. iridis*, *N. maximum* *N. amphirhynchus*) have been already reported in Bot. and Zool. Vol. III, No. 2, 1935.

Valves elongated, linear to broadly lanceolate. Raphe has the central pores turned in contrary directions. Axial area narrow, central area orbicular or somewhat transversally dilated. There are longitudinal lines on each side of valve and transversal, rarely oblique striation on the valve-surface. Striæ distinctly punctate.

1. *Neidium affine* (EHRENBERG) CLEVE var. *amphirhynchus* (EHR.) CLEVE in Syn. Nav. Diat. I, p. 68, 1894; Philip. Journ. Sci. Vol. 57, No. 4, p. 467. Pl. I, Fig. 21, 1935.

Valves linear, with slightly convex margins and truncate rostrate subcapitate ends. Length 43–78 μ , breadth 12–25 μ . Striæ about 20 in 10 μ .

Hab. On the decaying leaves or wood in stagnant water, ponds, and ditches.

Honshû: Hiroshima, prov. Aki (Y. IWAHASHI, March 1935); Shimonoseki, prov. Nagato (Y. IWAHASHI, April 1934).

Shikoku: Imabari and Ôzu, prov. Iyo (Y. IWAHASHI, Dec. 1936); Takamatsu, prov. Sanuki (Y. IWAHASHI, Dec. 1936).

Kyûshû: Fukuoka, prov. Chikuzen (Y. IWAHASHI, Aug. 1935).

Dist. Europe; Australia; New Zealand; Africa; China; Mongolia; This variety is new to the flora of Japan.

2. *Neidium iridis* (EHRENBERG) CLEVE in Syn. Nav. Diat. I. p. 69. 1894; SCHMIDT, Atlas Diat. Taf. XLIX, fig. 2.; MEISTER, Kiesalg. Schw. p. 108, Taf. XV, fig. 2. 1912; HUSTEDT, Bacill. (PASCHER's Suss. Mitteleur. Heft 10) p. 245, fig. 379, 1930; IWAHASHI, Bot. and Zool. Vol. III, No. 2, p. 428, fig. 1, 1935.

Valves linear-elliptical, 65–180 μ long, 15–30 μ wide in the middle part.

Transversal striæ 16-18 in 10 μ .

Some forms belonging this species are nearly akin to *N. iridis* fo. *vernalis*.

Hab. In stagnant water.

Honshû : Gokurakujiyama near Hiroshima, prov. Aki (Y. IWAHASHI, May 1934); Chôfu, prov. Nagato (Y. IWAHASHI, Agril 1935).

Dist. Europe; Iceland; Australia; North America; South America; Africa; Manchoukuo; Chosen; Eastern Japan (Tôkyô; Aoki-ko).

var. **ampliatus** (ERENBERG) PFITZER : MEISTER, in Kiesalg. Schw. p. 108, Taf. XV, fig. 3. 1912.

Syn. *Neidium iridis* var. *ampliata* (EHR.) CLEVE in Syn. Nav. Diat. I, p. 69, 1894; HUSTEDT, Bacill. p. 245, fig. 381, 1930.

Navicula (Neidium) iridis var. *ampliata* EHRENBURG in SCHÖNFELDT's Diat. Germ. p. 143, 1907.

Valves elliptic-lanceolate, with broad subrostrate ends. Length 57-98 μ , breadth 18-30 μ in the middle. Striæ 16-18 in 10 μ .

Hab. On the water-plants in the lake and stagnant water.

Honshû : Kibagata, Prov. Kaga (Y. IWAHASHI, Oct. 1935); Okayama, prov. Bizen (Y. IWAHASHI, Oct. 1935); Hiroshima, prov. Aki (Y. IWAHASHI, April 1934).

Dist. Europe; North America; Africa; Manchoukuo; Chosen.

This variety is new to the flora of Japan.

3. **Neidium maximum** (CLEVE) MEISTER in Kiesalg. Schw. p. 109, Taf. XV, fig. 5, 1912.

Valves very long, linear-lanceolate with obtusely rostrate ends. Length 175-230 μ , breadth 28-35 μ . Transapical striæ punctate, 16-18 in 10 μ .

Hab. In stagnant water and ditch.

Honshû : Gokurakujiyama near Hiroshima, prov. Aki (Y. IWAHASHI, May 1934).

Yakushima : Ambô-Kosugidani (Y. IWAHASHI, July 1933).

Dist. Europe; North America; Eastern Japan (Nojiri-ko).

4. **Neidium amphigomphus** (EHRENBURG) PFITZER : CLEVE, Syn. Nav.

Diat. I, p. 69, 1894; MEISTER, Kiesalg. Schw. p. 109, Taf. XV, fig. 6, 1912; IWAHASHI, Bot. and Zool. Vol. III, No. 2, p. 430, fig. 3, 1935.

Syn. *Navicula amphigomphus* EHRENBERG in SCHONFELD'S Diat. Germ. p. 144, 1907.

Neidium iridis var. *amphigomphus* (EHR.) V. HEURCK in Syn. Diat. Belg. Taf. XIII, fig. 2, 1880-1881.

Valves linear with wedge-shaped ends and nearly parallel margins. Length 90-150 μ , breadth 22-40 μ . Striæ about 16 in 10 μ .

Hab. In stagnant water and ditch.

Honshû: Gokurakujiyama near Hiroshima, prov. Aki (Y. IWAHASHI, May 1934); Mihara, prov. Bingo (Y. IWAHASHI, Nov. 1936).

Dist. Europe; Asia; Greenland; North America; South America; Africa; Chosen; Eastern Japan (Aoki-ko).

5. *Neidium Hitchcockii* EHRENBERG var. *oblique-striatum* SKV. in Philip. Journ. Sci. Vol. 57, No. 4, p. 468, Pl. I, fig. 22, 1935.

Valves with triundulated margins. Ends cuneate-rostrate, 40-51 μ long, 10-12 μ wide. Striæ strongly oblique to sagittal axis 18-20 in 10 μ .

This variety was firstly found from Poyang-Lake in China, 1935, by B.W. SKVORTZOW.

Hab. On the decaying leaves and branches in the lake and ditch.

Honshû: Kibagata, prov. Kaga (Y. IWAHASHI, Oct. 1925).

Kyûshû: Koshikishima (Y. IWAHASHI, Aug. 1934).

Dist. China.

This variety is a new addition to the flora of Japan.

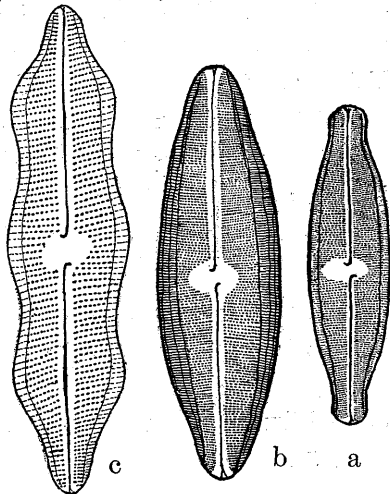


Fig. 9. a. *Neidium affine* var. *amphihynchus* ($\times 800$) b. *N. iridis* var. *ampliatum* ($\times 800$) c. *N. Hitchcockii* var. *oblique-striatum* ($\times 1300$)

IV Meridion 屬

今迄ニ知ラレテキル *M. circulare* ト其ノ變種デアル *var. constricta* ガ矢張り西部日本ノ淡水中ニモ分布シテキルコトガ分ツタ。而モ是等ノ兩方ハ相伴ツテ出現スルコトガ屢々デアル。(殊ニ上野ノ尾瀬沼カラ得ラレタ材料ヲ見ルト種ト變種ノ中間型ノ穀ヲ多數見ルコトガ出來ルノデアル)。

V. Diatoma 屬

筆者ハ曩ニ屋久島ニ於テ *D. hiemale* ヲ採取スルコトガ出來タガ、ソレ以後何處カラモ採取スル機會ヲ持タナイ。コレニ反シテ *var. mesodon* ハ可成屢々シカモ方々カラ採取スルコトガ出來タ。コノ變種ハ既ニ 1923 年、FR. HUSTEDT ニヨツテ青木湖カラノ材料中ニ存在シテキタコトガ發表サレテ居リ、服部廣太郎博士ハソノ論文ノ末尾ニ描圖ヲ掲ゲテ居ラレル。最近津村孝平氏ハ“七面山ノ御土”中カラ得タ材料ニヨツテ亦描圖サレテキル。

VI. Tabellaria 屬

淡水産珪藻トシテハ可成多ク見ラレル *T. fenestrata* ト *T. flocculosa* ノ外ニ *T. fenestrata* *var. lacustris* ヲ産スル。コノ變種ハヨク *T. fenestrata* ニ似テキルノデ注意シナイトソノ區別ガ分ラナイ。故ニ檢鏡ニ際シテハソノ Septum ノ數ニ注意スルコトガ必要デアル。即チ群叢中ノ各個體ヲヨク調べテ 2 septa ノミヲ穀ノ一方ノ側ニ有スルモノナラバ *T. fenestrata* デアルガ、1~3 septa ノモノガ入り交ツテ居レバソレハ *var. lacustris* ト見テヨイ。*var. lacustris* ハ今回筆者ニヨツテ初メテ我國ニ産スルコトガ分ツタノデアル。

VII. Actinella 屬

A. brasiliensis ハ唯朝鮮ニ於テ發見サレタダケデアツタノデアルガ、筆者ハ廣島地方デ極メテ稀デハアルガソノ所在ヲ確カメ得タノミナラズ、木場潟ニモ、門司ニモ同種ヲ見ルコトガ出來タ。殊ニ木場潟デハ可成多ク存在シテキタ。コレデ本屬ハ唯一種デハアルガ可成廣ク本邦ニ分布スルコトガ明カナツタ。

VIII. Peronia 屬

P. erinacea ハ 1923 年 FR. HUSTEDT ニヨツテ報告サレテキタノデアルガ、今回筆者ハ *P. Heribaudi* ヲ見ルコトガ出來タ。稀ニデハアルガ廣島地方・鹿児島・屋久島カラ得タ材料中ニ存在シテキタ。個體ガ小サイノデヨク見逃ガスコトガアル。

IX. Neidium 屬。

西部日本ニ産スル種類ハ 3 種・3 變種デアル。中デ今回新ニ見ラレタモノハ *N. affine* *var. amphirhynchus*, *N. iridis* *var. ampliatus*, *N. Hitchcockii* *var. oblique-striatum* ノ 3 變種デアル。